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ARRANGEMENT IN CONNECTION WITH ANAESTHETIC DEVICES

BACKGROUND OF THE INVENTION

The invention relates to an arrangement in connection with anaesthetic devices which comprise at least two module units, which are integrated to function together, and data transmission between the module units is carried out by means of a connector arrangement, which comprises contact means arranged in both module units.

Such arrangements are nowadays rather well known in the field of technology related to anaesthetic devices. Anaesthetic devices, such as different monitors used in the control rooms of hospitals for measuring and controlling vital functions and anaesthetic units with monitors and respiration apparatuses used mainly in the surgical wards of hospitals, usually comprise different module units which are integrated to function together in one way or another. Data transmission, e.g. electronic data transmission, between different module units has been implemented on a case by case basis taking into account the user's requirements. The most commonly used solution is a fixed module unit, in which solution the module unit is not meant to be disconnected and the connection is provided by a fixed cable. The drawback associated with this solution is that it is difficult to disconnect the module units from each other, and thus the solution can be applied only to certain devices.

If the user needs a mobile module, the typical known solution available is an arrangement consisting of a cable and a box. The drawback associated with this solution is that the arrangement comprises visible cables, which can be in the way, and thus hamper the use of the device in some situations. In the case of the solution comprising a cable and a box, changing and storing of the module units which have to be changed often may sometimes be difficult because of the cable.

To eliminate the disadvantages described above a solution in which a connector and a counter-connector are used between module units without an intermediate cable has been developed in the field. Such an arrangement implemented e.g. with generally known D connector pairs is quicker and more user-friendly than the arrangements described above, since there is no cable hampering the use. A disadvantage associated with solutions of this kind is that the connector has to be guided to the counter-connector very accurately, whereby rather accurate guiding members are needed between the module units, which easily results in rather expensive solutions. Another disadvantage is that the installation of the connector in the module unit is restricted so that the direction of the connectors has to be the same as the installation direction of the module units, whereby restriction of the motion of the module unit with respect to the installation direction requires precision, and possibly separate springs are needed in the connectors, which also increases costs. A further disadvantage is that uncovered, visible connectors dirty easily, which reduces conductivity of the connection. If the connection described above is not implemented as a floating arrangement for example by using springs, the vibration caused during transportation, for instance, may very easily damage the connector.

Further connection arrangements are also known in the field, such as infrared solutions, optical solutions, etc. External interferences, expensive arrangements which take up too much space, etc. constitute disadvantages of these solutions.

BRIEF SUMMARY OF THE INVENTION

An object of the invention is to provide an arrangement which allows to eliminate the disadvantages of the prior art.

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This is achieved with the arrangement of the invention, which is characterized in that at least one of the contact means is mobile so that when the module units and thereby the contact means are moved close to one another, the mobile contact means moves so that it comes into contact with the contact means in the other module unit as a result of magnetic force.

An advantage of the invention is, for example, that the connection between the module units is similar to the connection between bayonet joints, whereby the module units can be connected with each other electrically and disconnected from each other over and over again without the contact means of the connector arrangement wearing to a harmful extent. The arrangement of the invention can also be installed in the module unit without restrictions. Furthermore, the arrangement of the invention is hidden, which allows to avoid misuse, and it can be cleaned without interfering with its operation. Another advantage of the invention is that the connector does not require as accurate guiding as those of the prior art. The arrangement of the invention also sustains the vibration caused during transportation as well. The arrangement of the invention can be applied in a large variety of devices between different module units. The power transmission capacity of the arrangement of the invention can be adjusted on a case by case basis in a simple manner. In addition, the arrangement of the invention is cheap and can be implemented in a simple manner, while the operational reliability of the arrangement is good.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

In the following, the invention will be described in greater detail by means of a preferred embodiment illustrated in the accompanying drawings, in which

FIG. 1 is a schematic side view of the arrangement of the invention when two module units are being connected with each other;

FIG. 2 shows the connection of FIG. 1 in a situation in which the contact means are in contact with each other;

FIG. 3 is a schematic side view similar to FIG. 1 illustrating an alternate direction of movement between the two module units that are being connected with each other;

FIG. 4 is an alternate embodiment of the invention in which each contact means includes a magnetic member to aid in holding the contact means in contact with each other; and

FIG. 5 is an additional alternate embodiment in which the contact means include a connection for optical data transmission.

DETAILED DESCRIPTION OF THE INVENTION

FIGS. 1 and 2 schematically illustrate a preferred embodiment of the arrangement of the invention. Reference numbers 1 and 2 denote two module units of which module unit 1 is the vaporiser casing of an anaesthetic unit and module unit 2 is an anaesthetic vaporiser cassette. The module units 1 and 2 are shown only partially in FIGS. 1 and 2, since the structure and operation of the units in question is conventional technology to one skilled in the art, which will not be described more closely in this context. The module units are integrated to function together, and data transmission between the module units is carried out by means of a separate connector arrangement 3.